R E M A R K S

Reconsideration of this application is respectfully requested.

As explained in the Background section of the specification, during data transmission, if a large jitter occurs in a transmission signal, the signal cannot be correctly transmitted. The problem caused by jitter has been recognized, and the maximum permissible level of jitter in an interface in a digital transmission path has been set forth in international standards. Therefore, it is necessary to measure the jitter in order to determine whether the jitter falls within the prescribed maximum permissible level.

As described in the Background section of the specification, analog system jitter measuring apparatuses and digital system jitter apparatuses have been provided. However, the analog system jitter measuring apparatus suffers from a decrease in measurement resolution when the sensitivity of a phase detector or a voltage controlled oscillator is reduced to broaden the measurement range of the jitter. In the conventional digital system jitter measuring apparatus, jitter in a signal is measured by numerical processing to avoid reductions in measurement accuracy caused by the parts and/or environment of an analog system jitter measuring apparatus. The digital system jitter measuring apparatus can measure jitter with high reproducibility,

a broad measurement range, and a high measurement resolution.
However, as explained in the Background of the specification, the
conventional digital system jitter measuring apparatus is limited
in the amount of _time_ over which jitter can be measured. This
limitation is problematic since it can be necessary to measure
jitter for several minutes, or even for a day or more.

In view of these problems, the present invention provides a
jitter measuring apparatus and a jitter measuring method which
enable jitter to be measured at high resolution and for an
extended period of time.

Claims 1-13 are directed to a jitter measuring apparatus,
and claims 14-26 are directed to a jitter measuring method, and
it is respectfully submitted that the apparatus and method
according to the claimed present invention achieve a useful,
concrete and tangible result, namely, the determination of a
jitter amount of a signal to be measured.

Claims 1-26 have been rejected under 35 USC 101 as being
directed to non-statutory subject matter. The rejection under 35
USC 101 is divided into two specific rejections: first, the
Examiner contends that the claims are directed to "functional
descriptive material," and second, the Examiner contends that the
claims are directed to a mathematical algorithm without providing
a useful, concrete, and tangible result. Each of the grounds for
rejection under 35 USC 101 is addressed separately below.

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The Rejection for Reciting "Functional Descriptive Material"

As set forth in 35 USC 101, there are four categories of statutory subject matter, processes, machines, manufactures and compositions of matter. As recognized by the Examiner, mere descriptive material does not fall in one of the statutory categories and is not patentable. For this reason, claims may be rejected under 35 USC 101 if the claims recite descriptive material *per se*. See MPEP 2106.01.

In item 2 on page 2 of the Office Action, the Examiner contends that since software <u>may</u> be utilized to achieve various structures of the present invention, claims 1-26 recite a program and are therefore directed to nonstatutory subject matter.

It is respectfully pointed out, however, that claims 1-13 are directed to a jitter measuring <u>apparatus</u>, and that claims 14-26 are directed to a jitter measuring <u>method</u>. None of claims 1-26 is directed solely to descriptive material, *per se*.

It is respectfully pointed out, moreover, that an apparatus or method reciting structural features or steps performed by a computer may be directed to statutory subject matter (i.e., a machine and a process). *In re Allapat* 31 USPQ2d 1545. In *Allapat*, independent claim 15 recited an apparatus (specifically, a rasterizer) in which the elements thereof were recited in means-plus-function form. Allapat admitted that claim 15 was readable on a general purpose computer programmed to carry out

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the claimed invention. As explained by the CAFC, a claim

directed to an apparatus in which even all of the elements

thereof may be realized via software is not for that reason

nonstatutory:

> Alappat admits that claim 15 would read on a
> general purpose computer programmed to carry out
> the claimed invention, but argues that this alone
> also does not justify holding claim 15
> unpatentable as directed to nonstatutory subject
> matter. We agree. We have held that such
> programming creates a new machine, because a
> general purpose computer in effect becomes a
> special purpose computer once it is programmed to
> perform particular functions pursuant to
> instructions from program software.   In re
> Freeman, 573 F.2d 1237, 1247 n.11, 197 USPQ 464,
> 472 n.11 (CCPA 1978); In re Noll, 545 F.2d 141,
> 148, 191 USPQ 721, 726 (CCPA 1976); In re Prater,
> 415 F.2d at 1403 n.29, 162 USPQ at 549-50 n.29.

And as further noted by the CAFC, "[i]n any case, a computer,

like a rasterizer, is apparatus not mathematics." *In re Allapat*

31 USPQ2d at 1558.

    Thus, in accordance with the CAFC decision in *Allapat*, it is

respectfully submitted that apparatus claims 1-13 of the present

application are clearly directed to a machine, and therefore fall

within the categories defined by 35 USC 101.

    It is respectfully submitted, moreover, that a similar

rationale is applicable to method claims 14-26 of the present

application. In fact, MPEP 2106.01 I provides specific

instructions to Examiners for determining whether claims that are

readable on computer software are a process or descriptive

material:

> USPTO personnel should treat a claim for a
> computer program, without the computer-readable
> medium needed to realize the computer program's
> functionality, as nonstatutory functional
> descriptive material. When a computer program is
> claimed in <u>a process where the computer is
> executing the computer program's instructions</u>,
> USPTO personnel should treat the claim as a
> process claim. When a computer program is recited
> in conjunction with a physical structure, such as
> a computer memory, USPTO personnel should treat
> the claim as a product claim. (emphasis added)

Thus, as explained by the MPEP, a computer-related invention may

be a computer program (which is nonstatutory), a process which is

executed by a computer (which <u>is</u> statutory), or a computer

product (which <u>is</u> statutory).

It is respectfully submitted that even if claims 14-26 of

the present application are read as suggested by the Examiner,

they still recite a process which may be executed by a computer

programmed to execute the claimed invention, and claims 14-26 are

still directed to a statutory <u>process</u>, as explained by the MPEP.

Thus, it is respectfully submitted that none of claims 1-26

recites descriptive material *per se*, and accordingly it is

respectfully requested that the rejection under 35 USC 101 based

on the recitation of descriptive material be withdrawn.

The Rejection for Reciting A Mathematical Algorithm

In item 2 on page 2 of the Office Action, the Examiner also contends, without any supporting analysis, that claims 1-26 recite a mathematical algorithm that does not provide a useful, concrete and tangible result. For this reason, the Examiner has rejected claims 1-26 under 35 USC 101 as failing to recite statutory subject matter.

As recognized by the Examiner, a mathematical algorithm, in the abstract, is unpatentable. However, "[b]ecause Section 101 includes processes as a category of patentable subject matter, the judicially defined proscription against patenting of a 'mathematical algorithm,' to the extent that such a proscription still exists, is narrowly limited to mathematical algorithms in the abstract" (emphasis added). *AT&T Corp. v. Excel Communications Inc.*, 50 USPQ2d 1447.

The CAFC has explained how such a mathematical algorithm in the abstract may be identified: "Unpatentable mathematical algorithms are identifiable by showing that they are merely abstract ideas constituting disembodied concepts are truths that are not 'useful.'" *State Street Bank & Trust Co. V. Signature Financial Group Inc.,* 47 USPQ2d 1596.

Conversely, "to be patentable an algorithm must be applied in a 'useful' way." *State Street.* As restated by the CAFC in *AT&T*, this means that "a mathematical algorithm may be an

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integral part of patentable subject matter such as a machine or process if the claimed invention as a whole is applied in a 'useful' manner." *AT&T* 50 USPQ2d at 1451.

It is respectfully submitted that the Examiner has made no showing that claims 1-26 recite a mathematical algorithm with no useful purpose. Rather, the Examiner has merely broadly asserted that the claimed present invention is unpatentable for reciting a mathematical algorithm without a useful, concrete and tangible result.

As explained hereinabove and in the Background section of the specification, measuring jitter (for example in the interface of a digital transmission path) is necessary in order to determine whether a signal may be successfully transmitted.

Independent claim 1 recites a jitter measuring apparatus comprising, in particular, an integration unit which determines a jitter amount of the signal to be measured, and independent claim 14 recites, in particular, determining a jitter amount of the signal to be measured. And it is respectfully submitted that independent claims 1 and 14 both recite a useful result and practical application in the field of digital signal transmission.

It is respectfully pointed out, moreover, that the CAFC has held that the production of a number which has "specific meaning" is a useful, concrete and tangible result of a claimed invention.

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See *Arrythmia Research Tech. Inc. v. Corazonix Corp.,* 22 USPQ2d
1033, in which claims directed to a method and apparatus for
analyzing electrocardiograph signals were held to be statutory
"because the mathematical algorithm included within the process
was applied to produce a number which had specific meaning -- a
useful, concrete, tangible result -- not a mathematical
abstraction." *AT&T* 50 USPQ2d at 1452.

    It is respectfully submitted that the jitter amount
measurement produced by the claimed present invention has
specific meaning and is a useful, concrete, and tangible result
having a practical application in the field of digital signal
transmission.

    Accordingly, it is respectfully submitted that claims 1-26
are not directed to a mathematical algorithm in the abstract, and
it is respectfully requested that the rejection of claims 1-26
under 35 USC 101 on this basis be withdrawn.

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    In view of the foregoing it is respectfully requested that
the rejection under 35 USC 101 be withdrawn.

    If the Examiner has any comments, questions, objections or
recommendations, the Examiner is invited to telephone the

undersigned at the telephone number given below for prompt

action.

                              Respectfully submitted,

                              /Douglas Holtz/

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